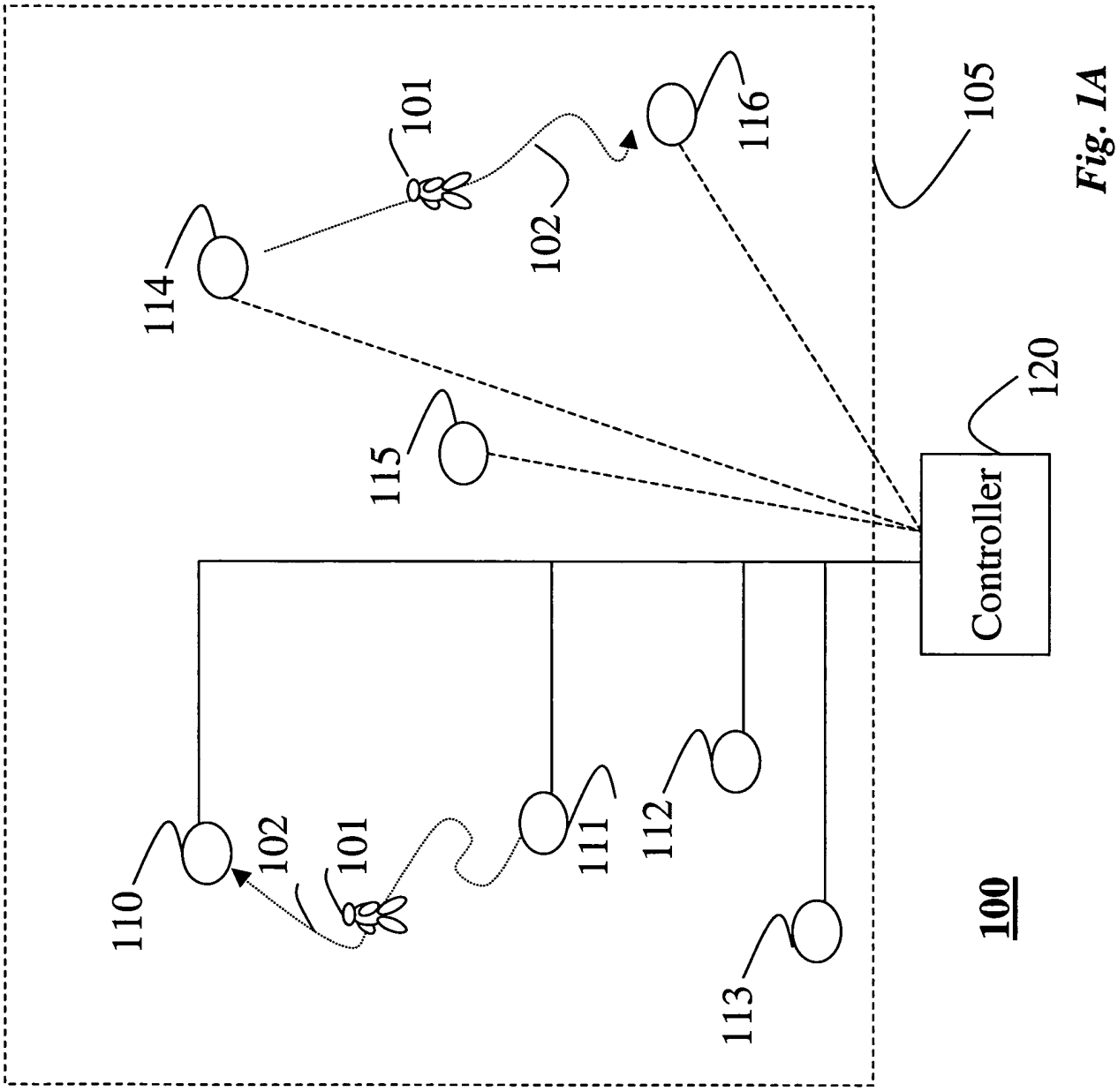

101
102
116
105
114
115
120
Controller
110
102
101
111
112
113
100

Fig. 1A

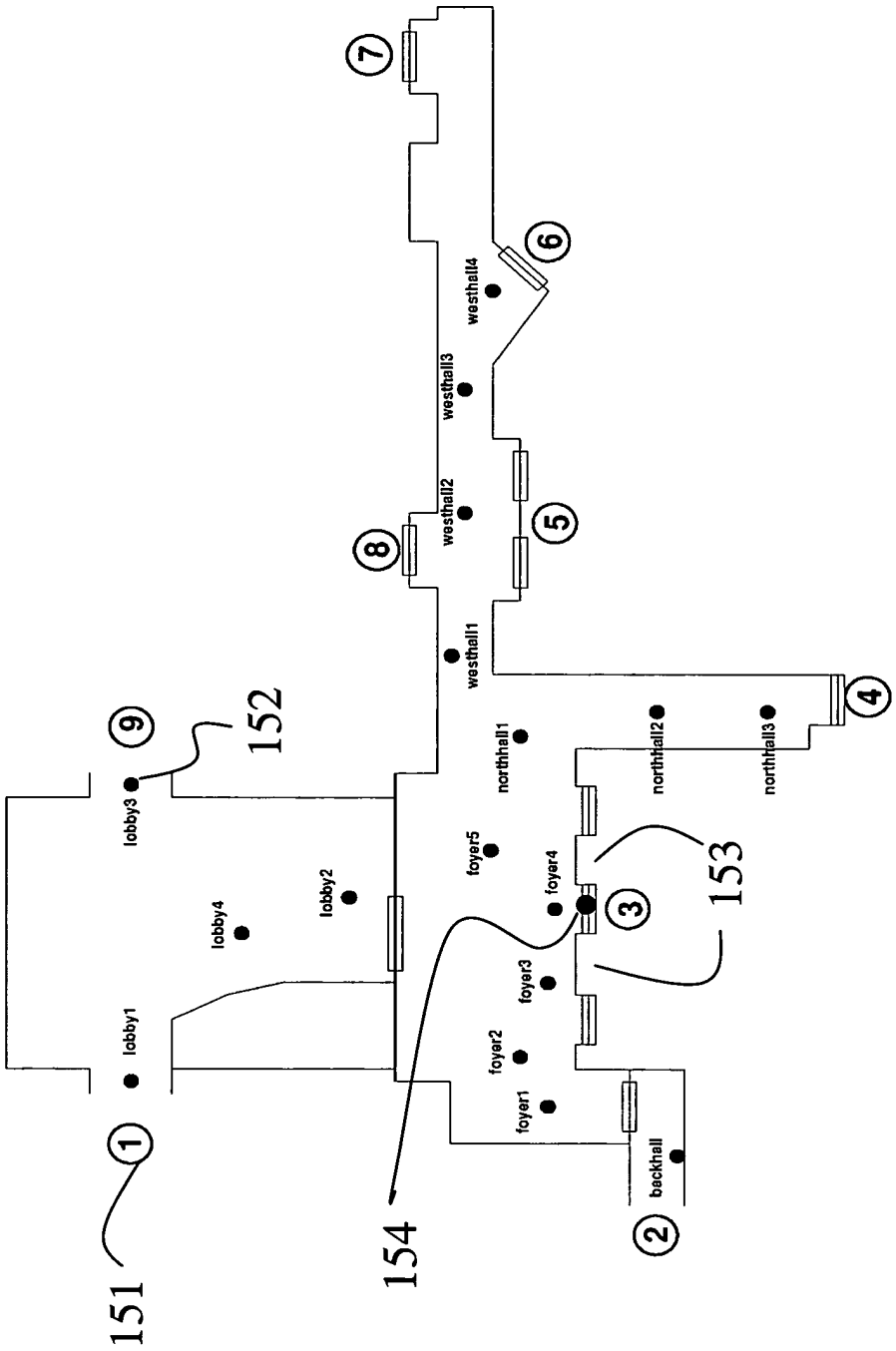
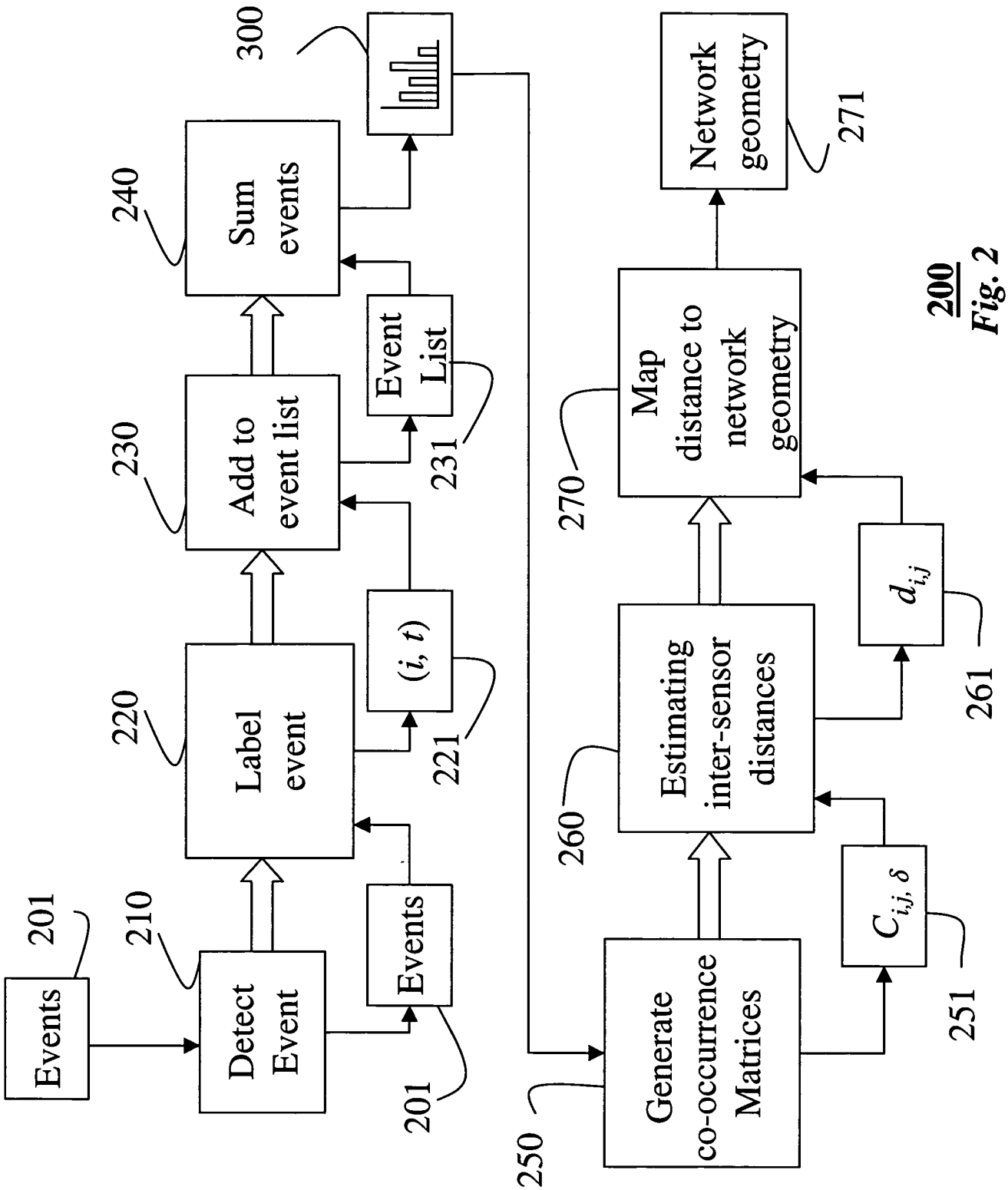
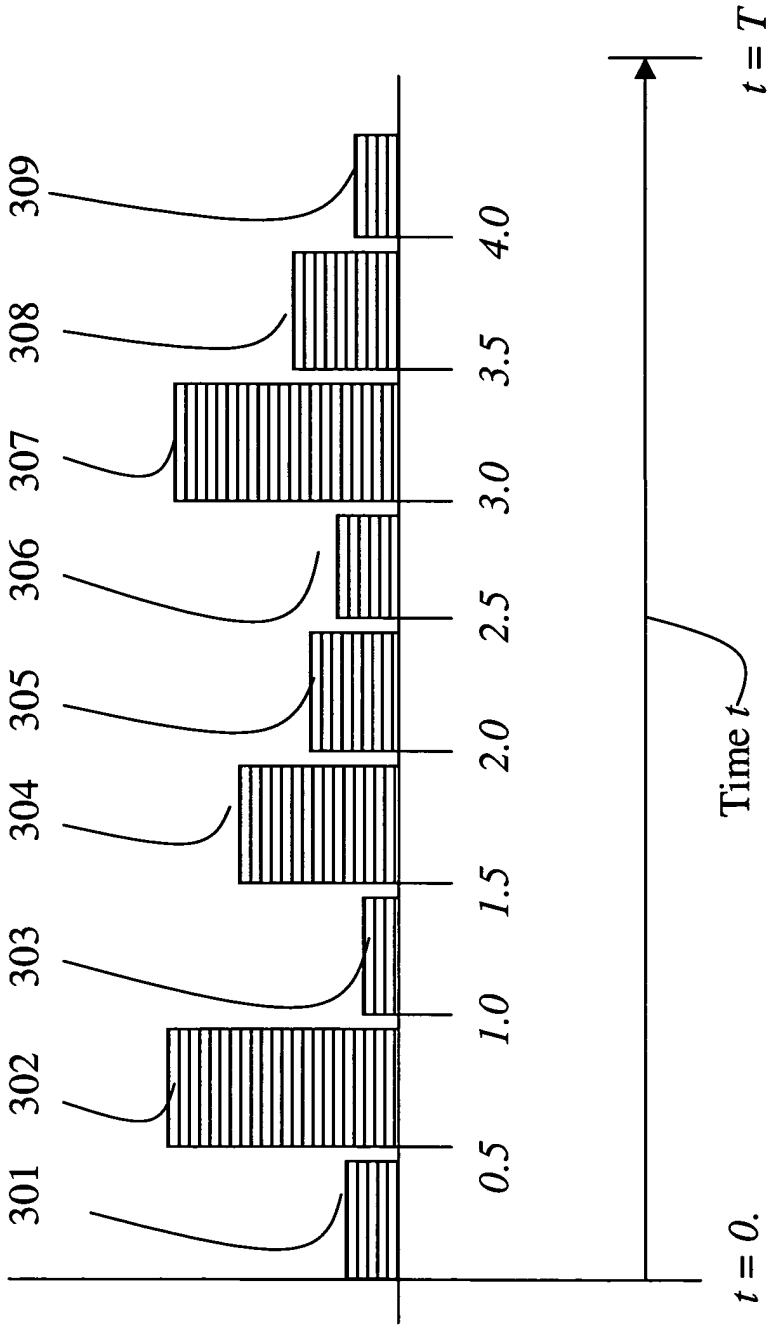

7
6
westhall4
westhall3
westhall2
5
8
westhall1
4
9
152
lobby3
northhall1
northhall2
northhall3
foyer5
foyer4
lobby2
lobby4
3
153
foyer3
lobby1
foyer2
foyer1
backhall
1
2
151
154

Fig. 1B


Events
201
Detect Event
210
Events
201
Label event
220
(i, t)
221
Add to event list
230
Event List
231
Sum events
240
300
Generate co-occurrence Matrices
250
$C_{i,j,\delta}$
251
Estimating inter-sensor distances
260
$d_{i,j}$
261
Map distance to network geometry
270
Network geometry
271

200
Fig. 2


t = T
309
308
307
306
305
304
303
302
301
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
Time t
t = 0.

300
Fig. 3

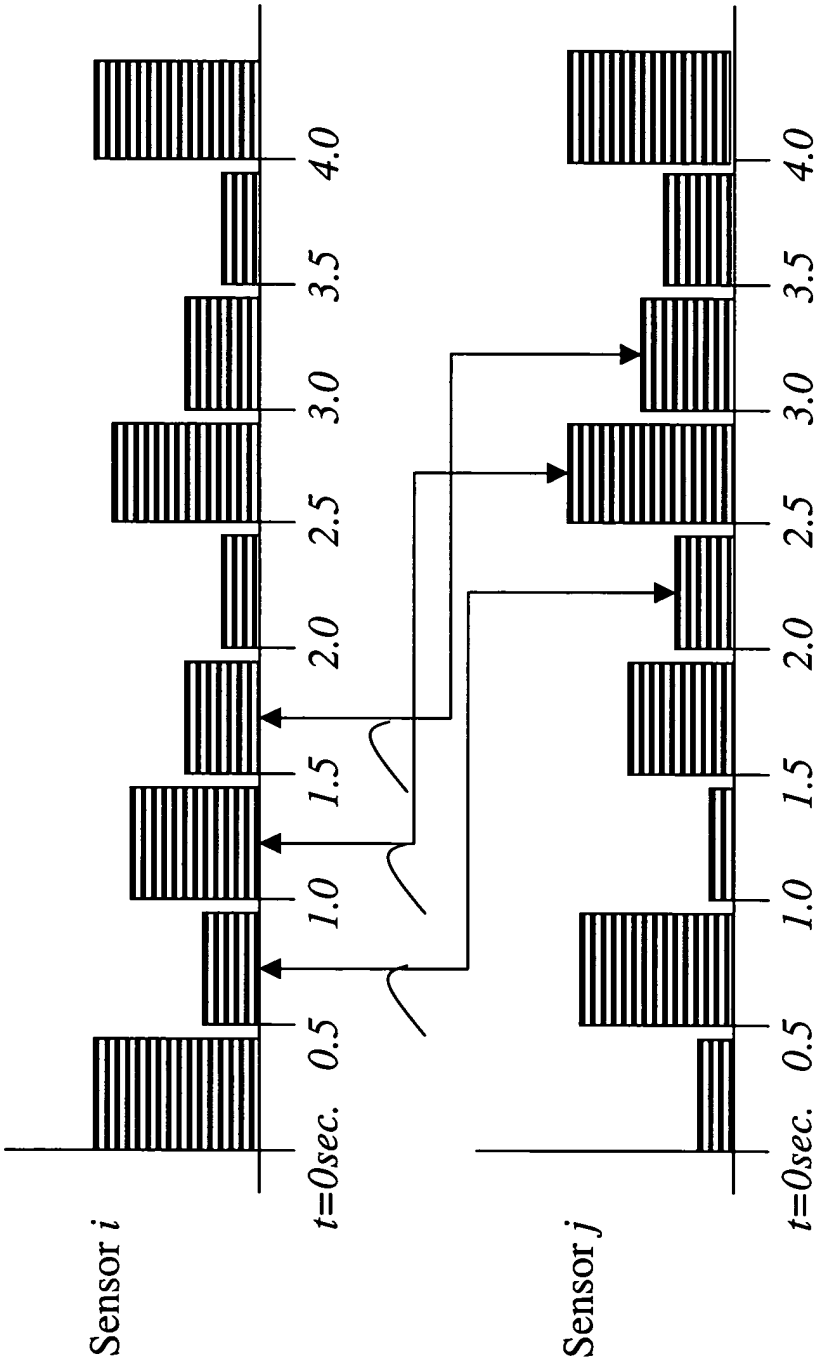

Sensor i
t=0sec.
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Sensor j
t=0sec.
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

Fig. 4

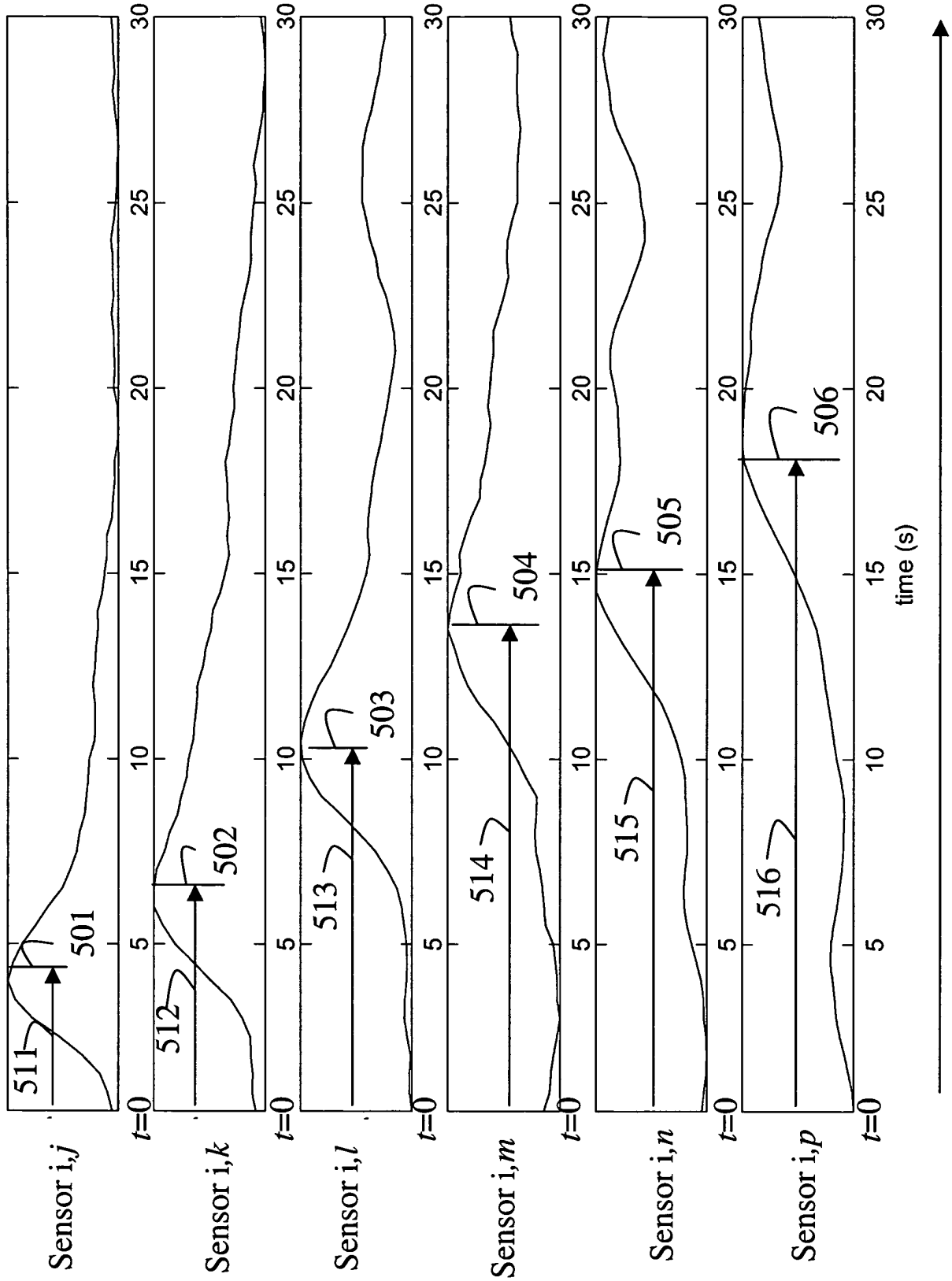

Sensor i,j
Sensor i,k
Sensor i,l
Sensor i,m
Sensor i,n
Sensor i,p
t=0
0
5
10
15
20
25
30
time (s)
501
502
503
504
505
506
511
512
513
514
515
516

Fig. 5

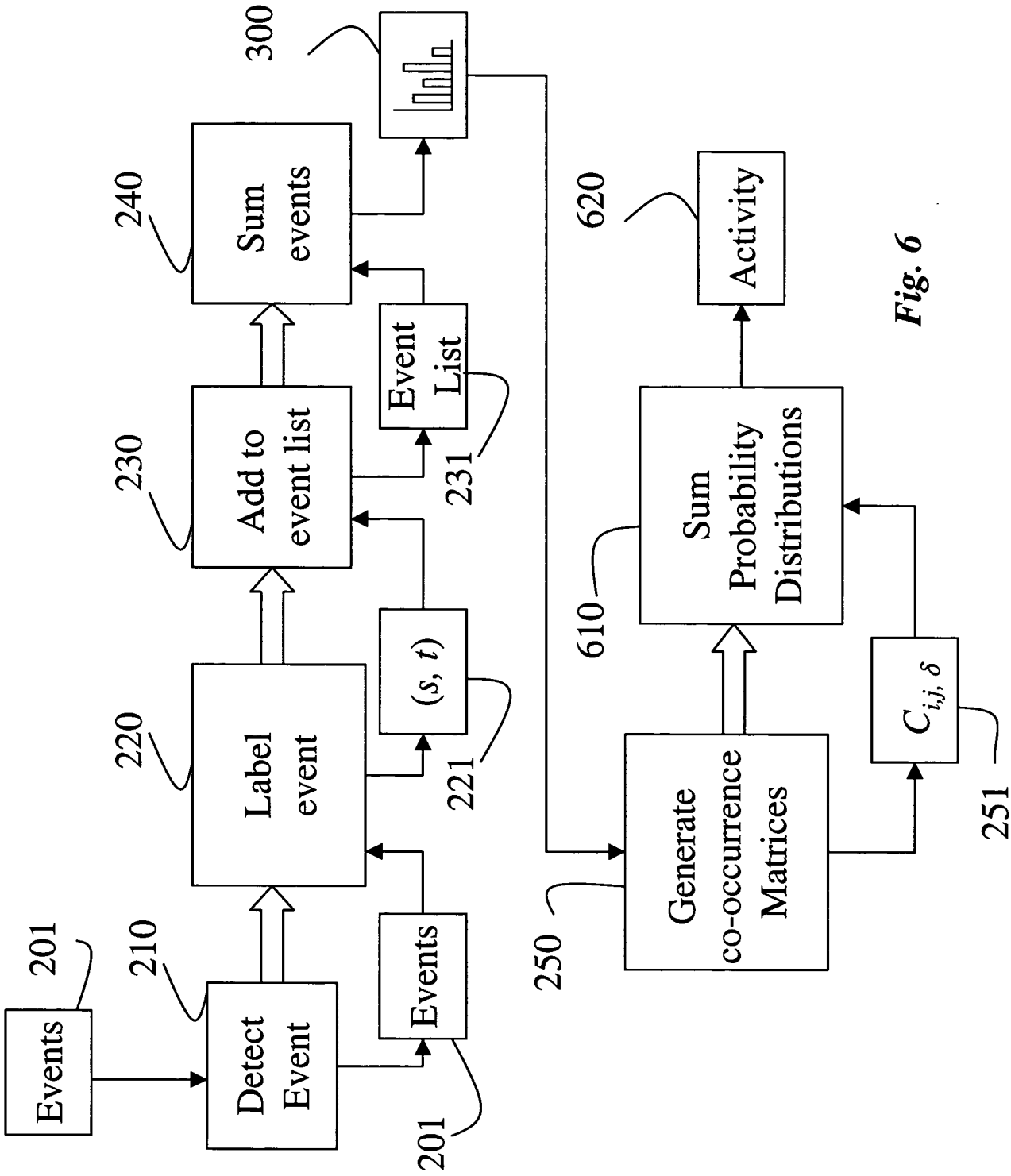

Events
201
Detect Event
210
Events
201
Label event
220
(s, t)
221
Add to event list
230
Event List
231
Sum events
240
300
Generate co-occurrence Matrices
250
$C_{i,j,\delta}$
251
Sum Probability Distributions
610
Activity
620

Fig. 6

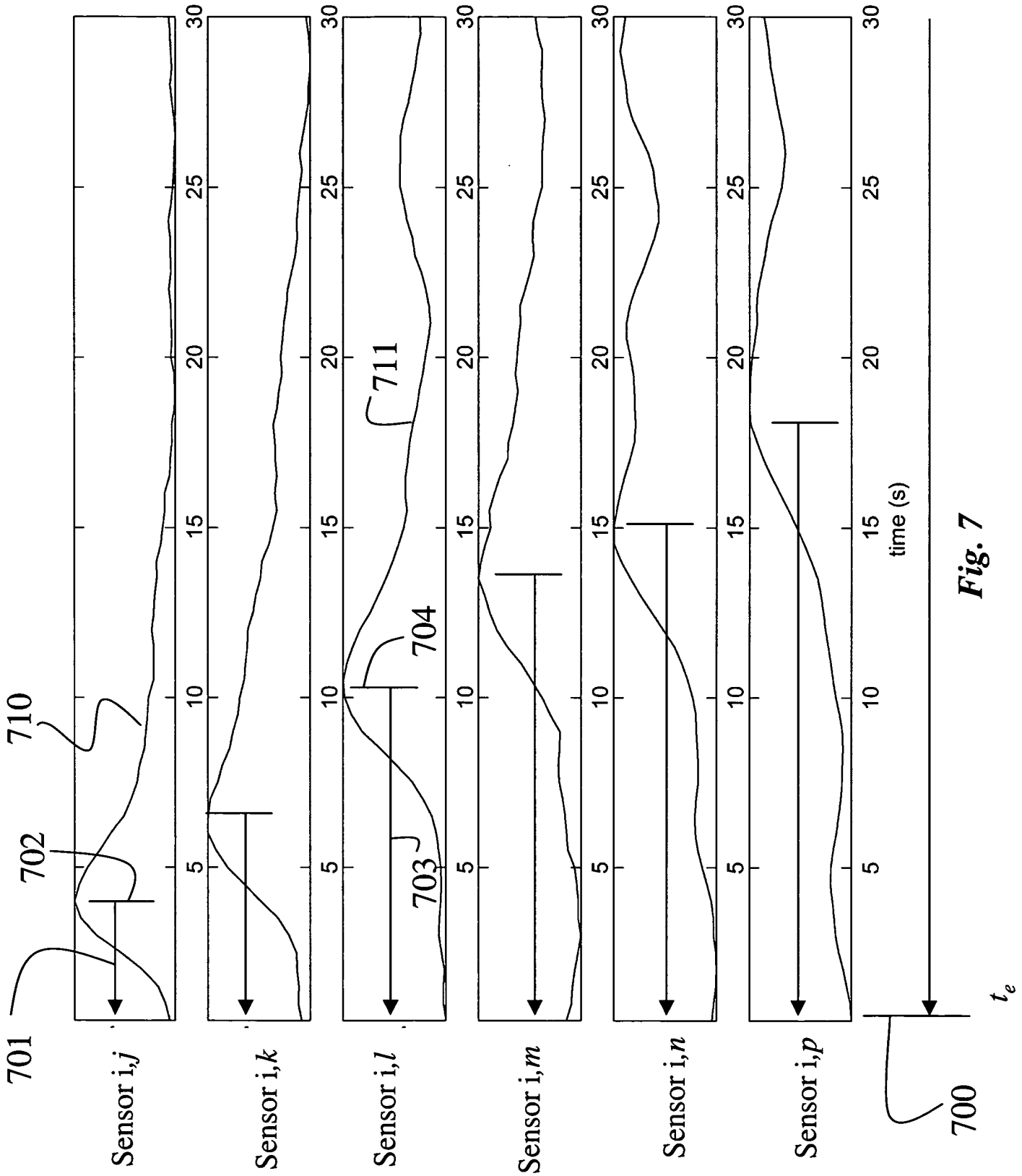

701
710
702
704
703
711
700
t_e
Sensor i,j
Sensor i,k
Sensor i,l
Sensor i,m
Sensor i,n
Sensor i,p
0
5
10
15
20
25
30
time (s)

Fig. 7

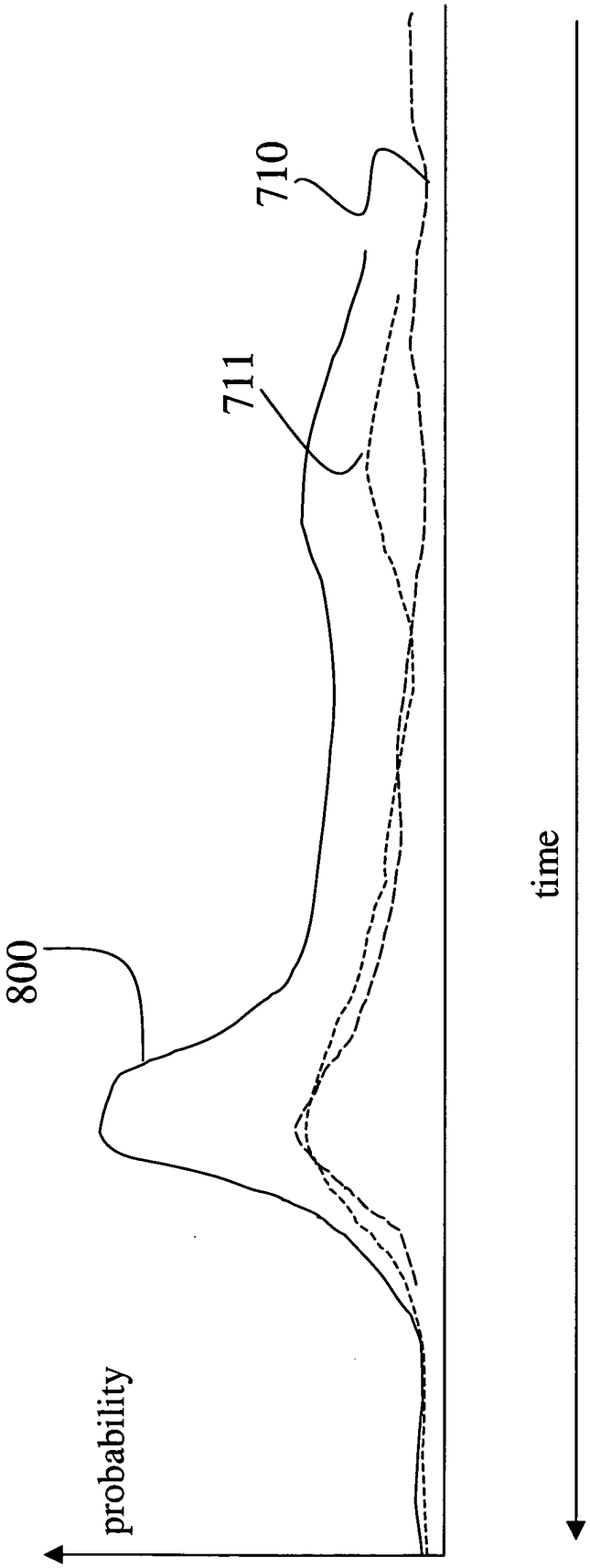


Fig. 8

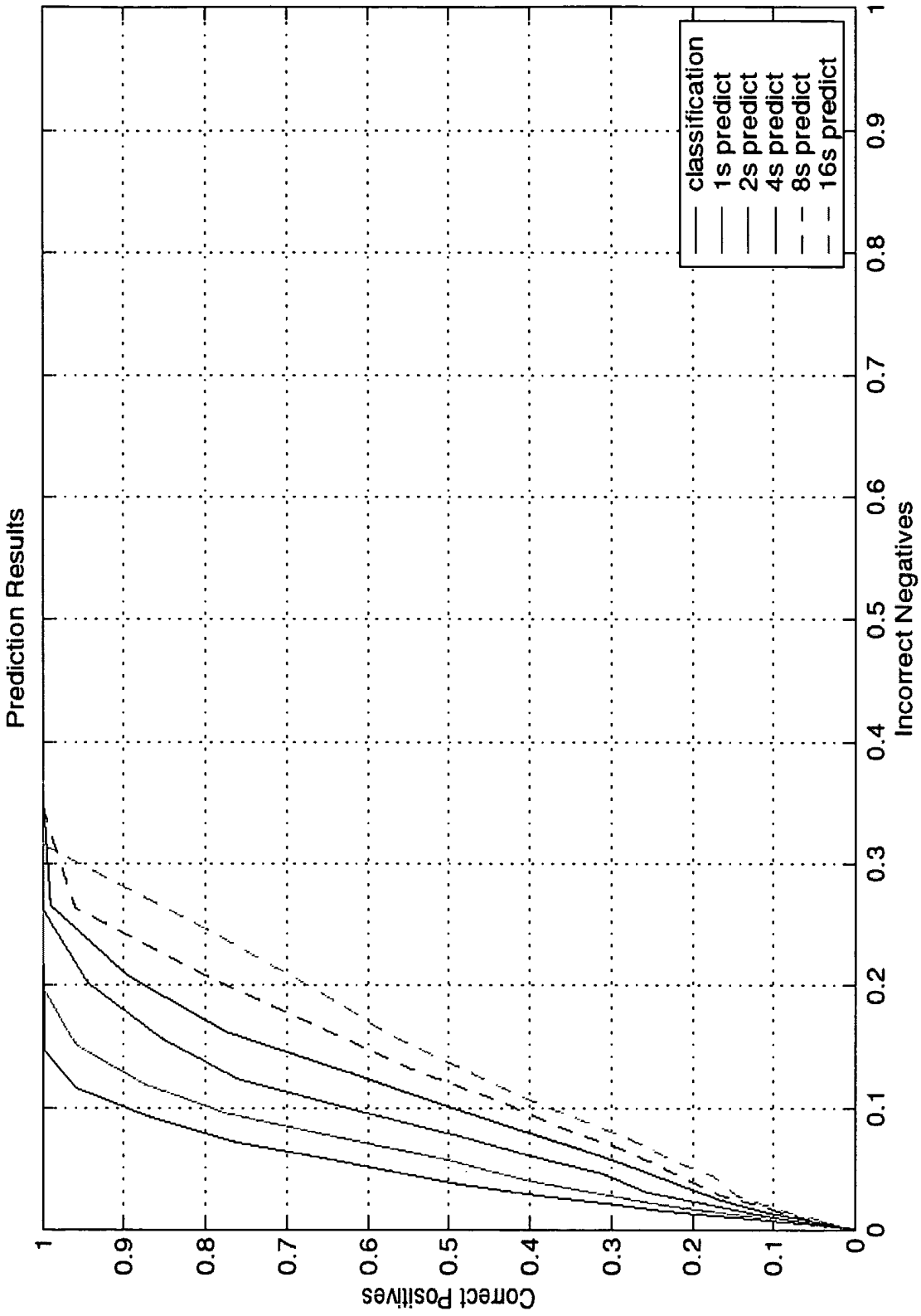

Prediction Results
Correct Positives
Incorrect Negatives
classification
1s predict
2s predict
4s predict
8s predict
16s predict
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

Fig. 9